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# A New Species of *Luzula* Sect. *Luzula* (Juncaceae) from Costa Rica

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**ABSTRACT.** A new species of *Luzula* sect. *Luzula* DC., known from higher altitudes of volcanic hills in Costa Rica, is described under the name *Luzula ignivoma* Kirschner. It is most closely related to the Chilean species *L. tristachya* Desvaux. New Central American country records of other species of the Juncaceae are also given: *Juncus marginatus* Rostkovius from Panama, *Juncus hybridus* Brotero, and *J. cooperi* Engelman from Mexico.

**Key words:** Central America, Juncaceae, *Juncus*, *Luzula*.

The diversity of the Juncaceae in Central America was recently summarized in several major taxonomic works (Balslev, 1996, 1994; Kirschner et al., 2002a, b, c). However, a more detailed exploration of the extremely rich region and further taxonomic research of complicated groups continue to reveal new taxa and country records. The present paper describes the new species *Luzula ignivoma* Kirschner, identified after herbarium study of Central American material and an expedition to western Panama.

## MATERIAL AND METHODS

Herbarium material was studied at (or obtained on loan from) the herbarium collections AAU, F, MO, PR, PRA, and in particular at NY. The material collected by J. Kirschner and L. Kirschnerová in 2004 in Chiriquí Province, Panamá, is deposited at PRA and PMA. For the sake of comparability, all measurements were done according to standard methods (Kirschner et al., 2002a: 19).

***Luzula ignivoma*** Kirschner, sp. nov. TYPE: Costa Rica. Cartago: Volcán Irazú, NE slope below crater, 9°19'N, 83°51'W, 3200 m, 21 Jan. 1983, G. Davidse 23133, L. D. Gomez, M. Sousa, C. J. Humphries, N. Garwood, R. Hampshire & M. Gibby (holotype, NY; isotype, MO). Figures 1, 2.

Species e *Luzula* sectione *Luzula* DC. insignis caulibus ad basin incrassatis, saepe subbulbosis, inflorescentia plerumque congesta vel subcongesta, tepalis conspicue acuminato-aristatis et seminibus magnis ellipsoideis bre-

viter carunculatis; *L. tristachya* Desvaux primo ad aspectu maxime similis sed rhizomate sat elongato ascendente, caulibus ad basin incrassatis, inflorescentia multiflora interdum ramosa, antheris filamentis paulo longioribus, bracteolis longioribus conspicue ciliatis et stigmatibus brevioribus.

Plants caespitose to loosely caespitose, to 35 cm tall, with short to medium length ascending rhizomes; shoots shortly ascending, usually with swollen, bulbous base; stem  $\pm$  rigid, erect. Basal leaves numerous, densely arranged, densely ciliate, with papillose margins,  $\pm$  flat to slightly canaliculate, usually to 8, less often to 12 cm, 3.2–4 mm wide, apex obtuse; cauline leaves 1(to 2), 2–3.5(–7) cm, densely ciliate at the blade base, with densely finely papillose margins. Inflorescence composed of 3 to 6, usually sessile clusters, inflorescence usually more than 30-flowered, congested, usually ca. 1–1.5  $\times$  ca. 1 cm, or 1 to 2 clusters pedunculate; clusters of 7 to 12 flowers, inflorescence branches to ca. 3 cm, the longer peduncles  $\pm$  smooth, straight, 0.5–2 cm, thick (0.4–0.6 mm); overall inflorescence color from paler brown to castaneous; lower inflorescence bract  $\pm$  erect-patent, 1.2–1.7 cm, not overtopping the inflorescence; bracteoles scarious, narrowly lanceolate, usually long-acuminate, 2–3.5 mm, conspicuously long-ciliate. Tepals narrowly lanceolate to linear-lanceolate, conspicuously long-acuminate, outer ones slightly carinate, 3.2–4 mm, usually  $\pm$  equaling, seldom distinctly longer or shorter than the inner ones, the inner tepals ca. 0.7–0.8 mm wide, castaneous to dark castaneous, either  $\pm$  evenly colored or with a gradually paler margin; perianth longer than ripe capsule; stamens 6, anthers 0.7–1(–1.2) mm, slightly longer than 0.6–0.8 mm long filaments; style ca. 0.7–0.8 mm, stigmas 1.5–1.9 mm. Capsule broadly ovoid, 2.3–2.7 mm, apex trigonous-acute, gradually tapering into a short mucro, deep castaneous. Seeds dark brown, narrow, ellipsoid, 1.2–1.3 mm long (excluding appendage), ca. 0.7 mm wide, appendage 0.2(–0.3) mm.

**Distribution and ecology.** The new species, collected from 3000 to 3300 m in elevation, is confined to high mountain vegetation of volcanic mountains in the province of Cartago, Costa Rica. For the time



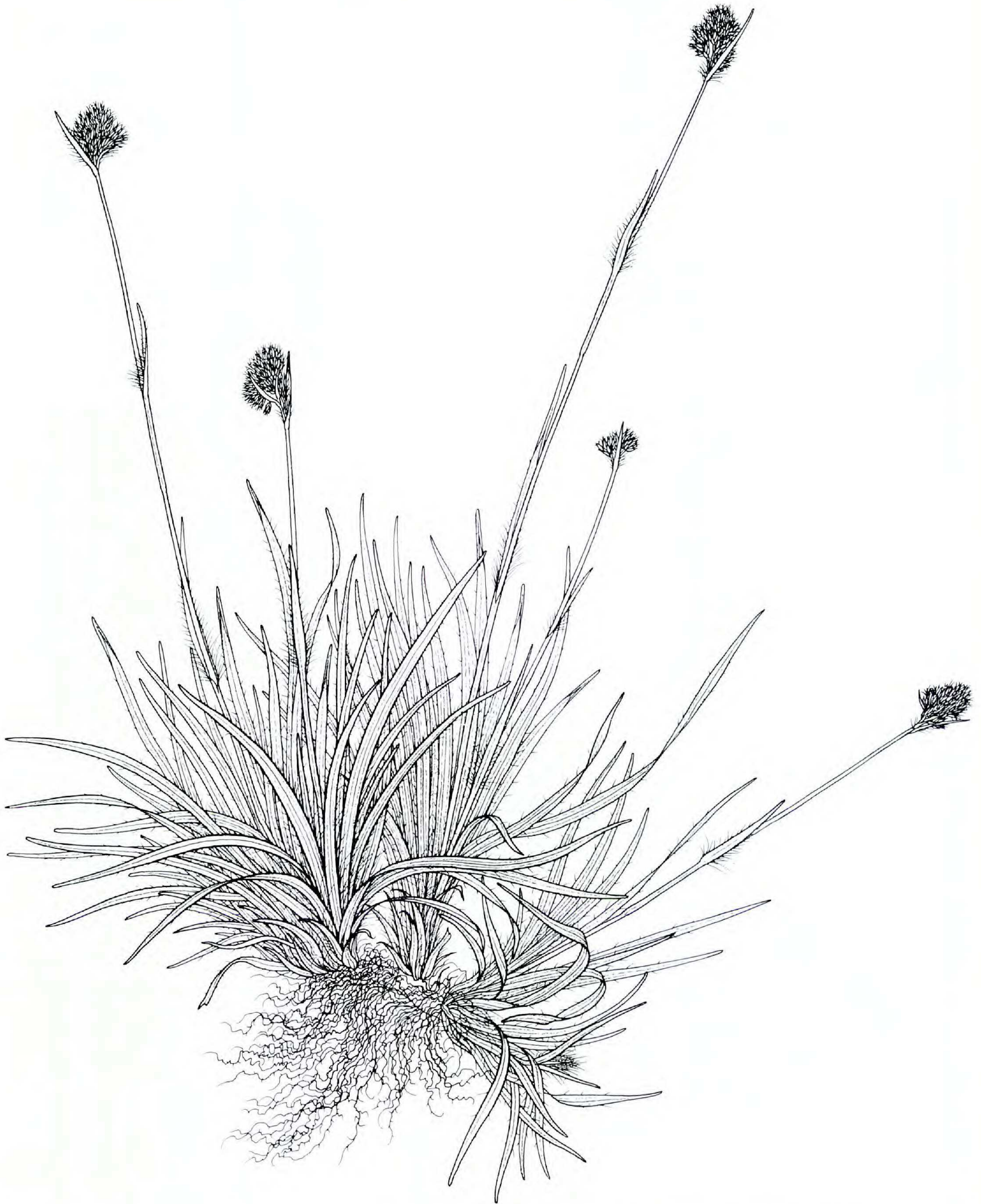


Figure 1. *Luzula ignivoma* Kirschner, general habit. Drawn from the isotype *G. Davidse 23133 et al.* (MO).

being, it is recorded from volcanoes of Turrialba and Irazú.

*Relationships.* *Luzula ignivoma* is most closely related to the only native Chilean member of *Luzula* sect. *Luzula*, *L. tristachya*. In particular, the two species are almost identical in the seed and capsule characters. The most conspicuous diagnostic features

of *L. ignivoma* (see also Table 1 and Figs. 1, 2) are longer, ascending rhizomes; a swollen stem base; a shorter stigma; aristate tepals; longer and narrower, densely long-ciliate bracteoles; and a higher number of flowers in the inflorescence. It should be added that there is no North American member of the section *Luzula* approaching the character combination of the Costa Rican species.



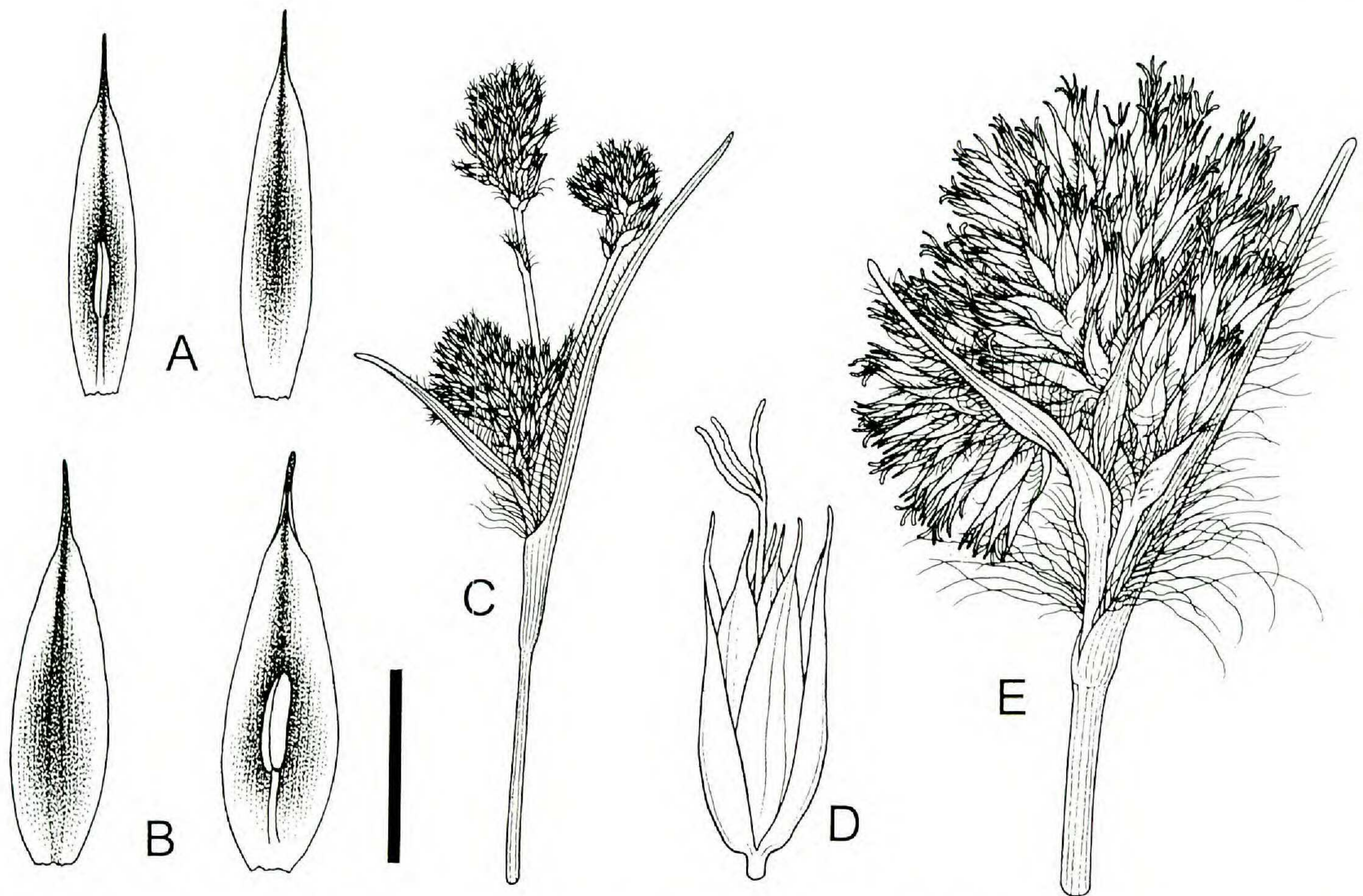


Figure 2. *Luzula ignivoma* Kirschner. —A. Inner tepals. —B. Outer tepals. —C. E. Inflorescence. —D. Flower. Scale bar: A, B, D = 1.5 mm; C = 12 mm; E = 4 mm. A, B, D, E drawn from *G. Davidse et al.* 23133 (MO); C from *G. Davidse & R. W. Pohl* 1182 (MO).

Most of the specimens cited below were previously studied by H. Balslev (1996) and identified as *Luzula campestris* var. *multiflora*, which was eventually (on the basis of an incomplete AAU specimen) provisionally accepted in the monograph of the family (Kirschner et al., 2002a, under *L. multiflora* subsp. *multiflora*). Although *L. multiflora* (Ehrhart) Lejeune subsp. *multiflora* is an extremely variable taxon, the character combination of *L. ignivoma* is not found among the numerous forms included in the northern subspecies. In particular, the acuminate tepals; usually obovoid, obtuse capsules; densely caespitose growth; and ovate-lanceolate subentire to sparsely ciliate bracteoles 1.5–2.5 mm are different from those of *L. ignivoma*.

**Etymology.** The specific epithet is from the Latin “ignivomus,” defined as fire-vomiting or volcanic.

**Paratypes.** COSTA RICA. **Cartago:** Volcán Turrialba, upper slopes near rim of crater, *G. Davidse & R. W. Pohl* 1182 (F, MO), along creek in partially wooded pasture, *G. Davidse & R. W. Pohl* 1183 (AAU, MO, NY), crater rim, *A. S. Weston* 6153 (F), S slopes, *A. S. Weston* 4961 (F); 12 km N of the jet. at Trinidad en route to Volcán Turrialba, within 0.5 km of crater rim, *F. Almeda* 737 (F).

#### *JUNCUS MARGINATUS*, A NEW SPECIES REPORT FOR THE FLORA OF PANAMA

*Juncus marginatus* Rostkovius is widespread in many areas of North, Central, and South America. Up to now, it has been recorded from a number of

Table 1. Character comparison between *Luzula tristachya* and *L. ignivoma*.

	<i>L. ignivoma</i>	<i>L. tristachya</i>
Rhizome	medium length (usually > 1.5 cm), ascending	short (< 1 cm)
Stem base	swollen, bulbous	not swollen
Flower number in inflorescence	usually > 30	usually < 15–20
Bracteole shape	narrowly lanceolate	ovate
Style/stigma length, mm	0.7–0.8/1.5–1.9	0.4–0.5/2–3
Filament length, mm	0.6–0.8	0.4–0.5
Seed appendage length, mm	0.2(–0.3)	0.1–0.2



localities from Mexico to Costa Rica in Central America, the only country without any records being Panama. During an expedition to the Chiriquí Province, the species was found at several places along the road connecting the town of Chiriquí with the Caribbean side of Panama, mostly in the vicinity of the artificial reservoir of Lago Fortuna. The character of these localities (wet places and ditches along the road) suggests that the species was introduced quite recently.

*Juncus marginatus* belongs to the section *Graminifolii* G. Engelm., characterized by flat, grass-like leaves without septa. It is the most widespread species in the section, which is otherwise composed of species with mostly rather small geographical ranges.

*Specimens examined.* PANAMA. **Chiriquí:** Lago Fortuna region, Quebrada Cristallina, Km 59 of road from Lago Fortuna to Palo Seco, *J. Kirschner & L. Kirschnerová 8a* (PMA, PRA); Quebrada Alemán Trail, near road, *J. Kirschner & L. Kirschnerová 8* (PMA, PRA); Km 45, road betw. Lago Fortuna & town of Chiriquí, *J. Kirschner & L. Kirschnerová 39* (PMA, PRA).

#### *JUNCUS HYBRIDUS* NEW TO MEXICO

The section *Tenageia* Dumortier of the genus *Juncus* L. comprises annuals that have the highest diversity in the westernmost Mediterranean, particularly in Spain, Portugal, and Morocco. The most common annual species on subsaline soils in that region is *J. hybridus* Brotero. Thus, it is not surprising that the latter species is quite commonly found introduced or naturalized in the territories explored and conquered by Spanish and Portuguese voyagers and conquistadores—Chile, Argentina, California, etc. (Kirschner et al., 2002c). The species was found among the specimens collected in Mexico and deposited in NY. *Juncus hybridus* is related to the group of *J. bufonius* L. It is distinct within this species group in its inflorescence constituting about one third of the plant height and composed of dense 2- to 6-flowered clusters and a perianth usually 5–7.5 mm.

*Specimen examined.* MEXICO. **San Luis Potosí:** San Luis Potosí, *J. G. Schaffner 211* (NY).

#### *JUNCUS COOPERI*, A NEW SPECIES IN MEXICO

*Juncus* sect. *Juncus* comprises mostly coastal obligate halophytes with pungent leaves. One of the most peculiar species of the section, characterized by its stout, creeping rhizome and large seeds (to 1.9 mm), is *J. cooperi* Engelm., known from inland

saline semidesert areas in California and Nevada, U.S.A. (Kirschner et al., 2002b). Some of the known localities are not far from the Mexican border, but it was not until the author studied Mexican material in NY that the species was identified from the northwestern Sonora as a new member of the Mexican flora.

*Specimen examined.* MEXICO. **Sonora:** NW Sonora, Laguna Prieta, Gran Desierto, *E. Ezcurra* (NY).

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